

1/32

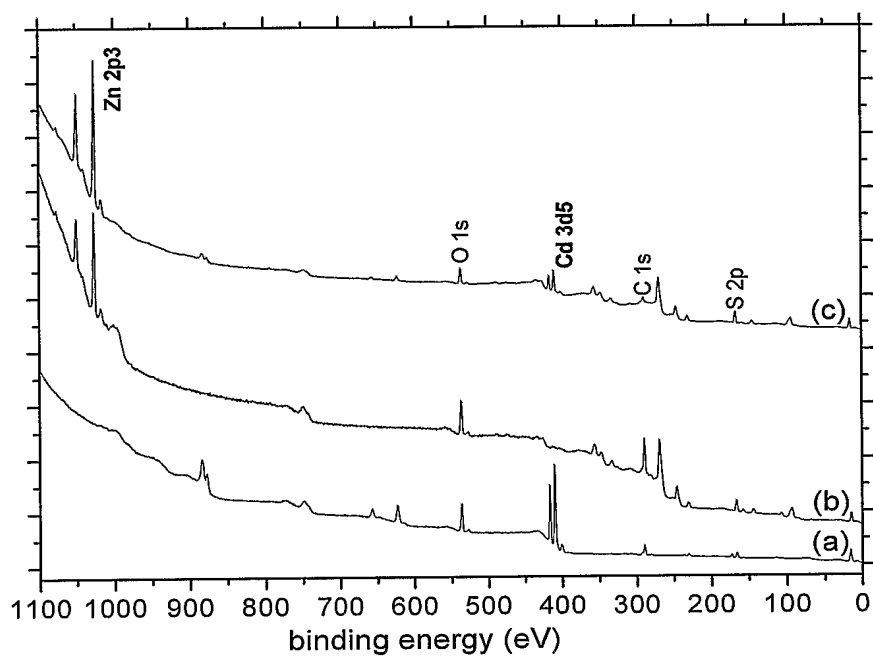


FIG. 1

2/32

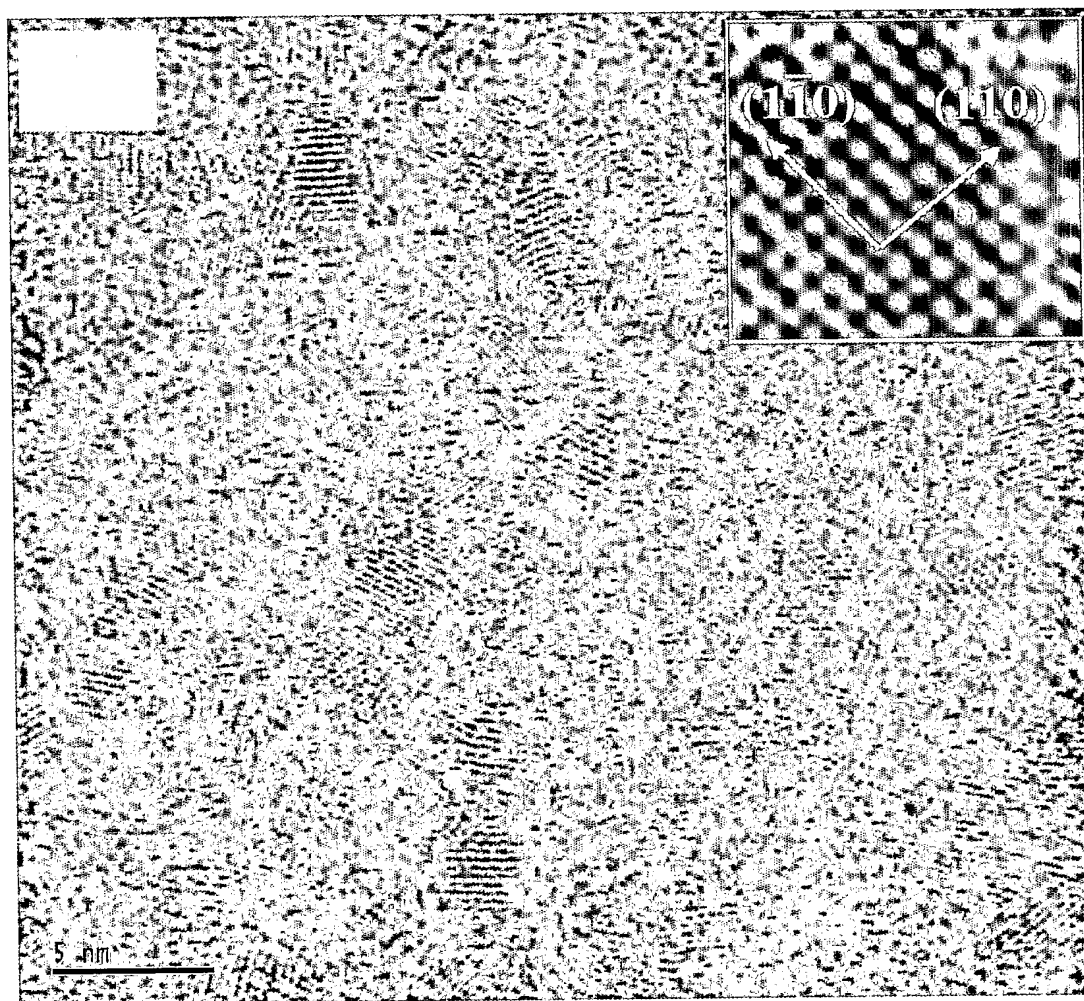


FIG. 2A

3/32

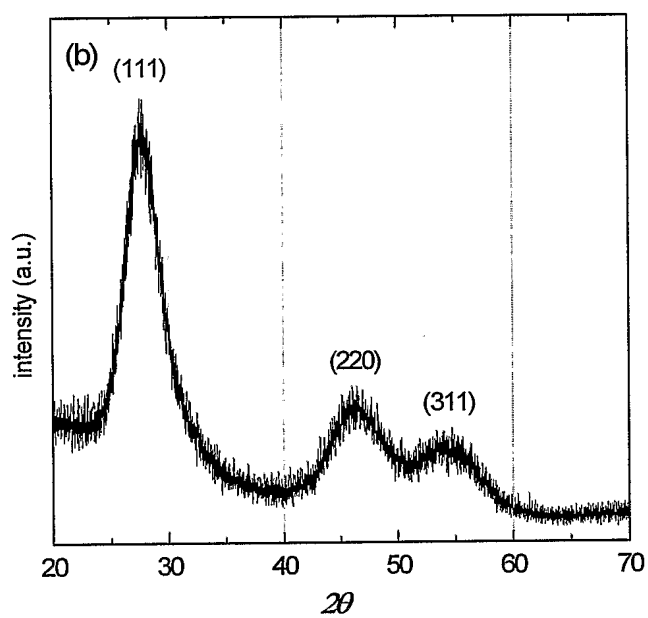


FIG. 2B

4/32

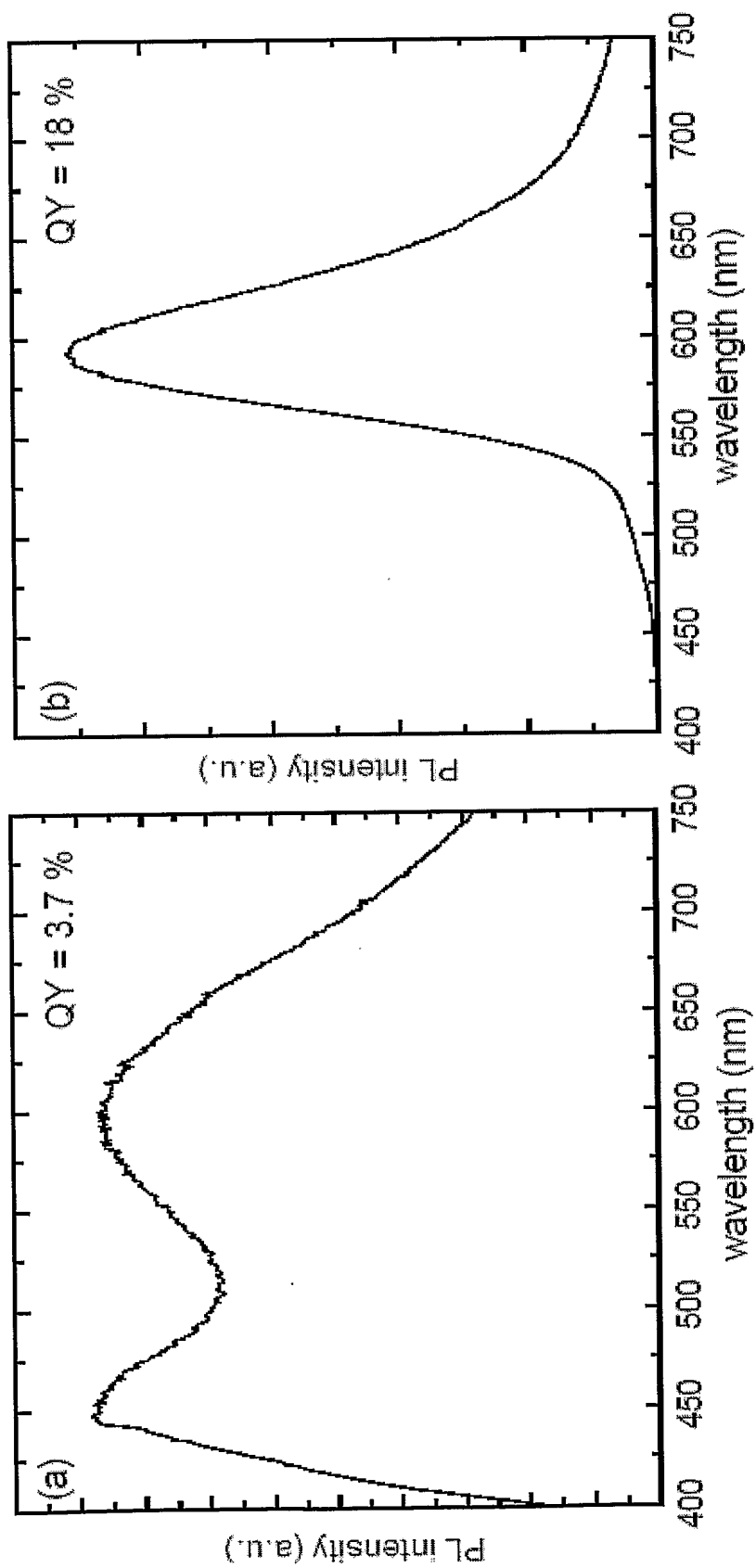


FIG. 3A

FIG. 3B

FIG. 4

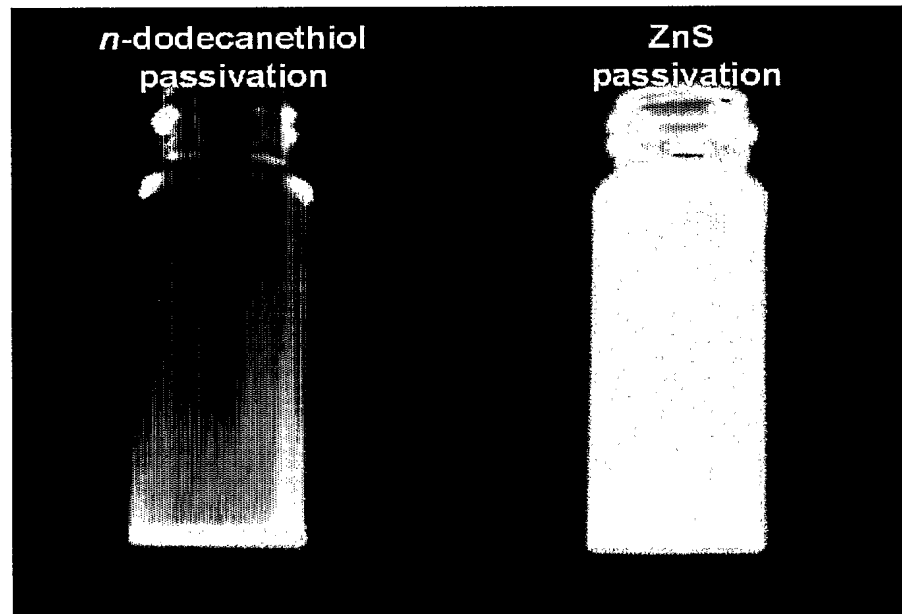
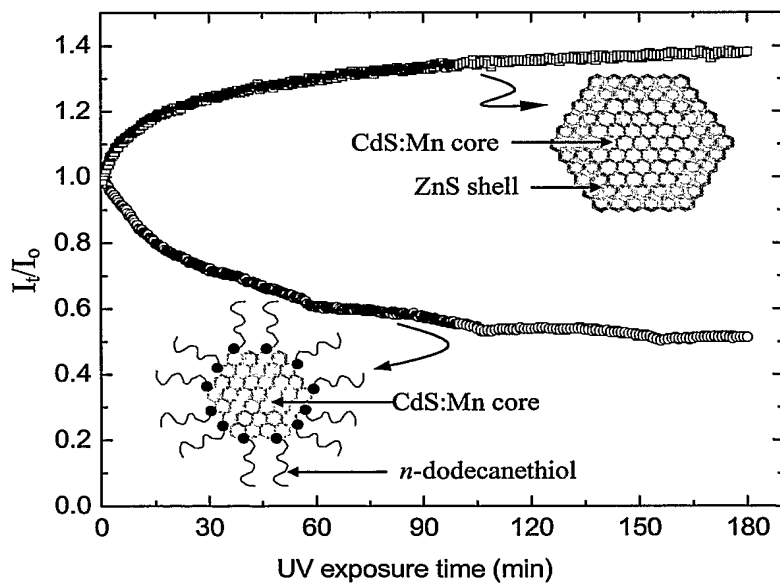


FIG. 5



6/32

FIG. 6

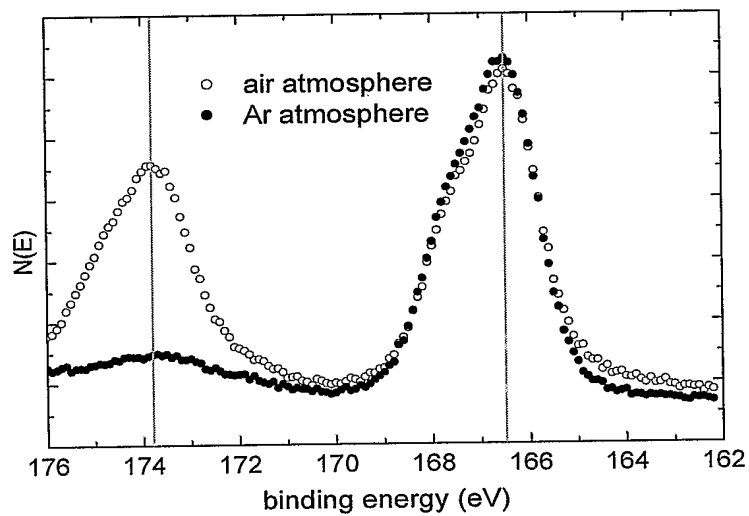
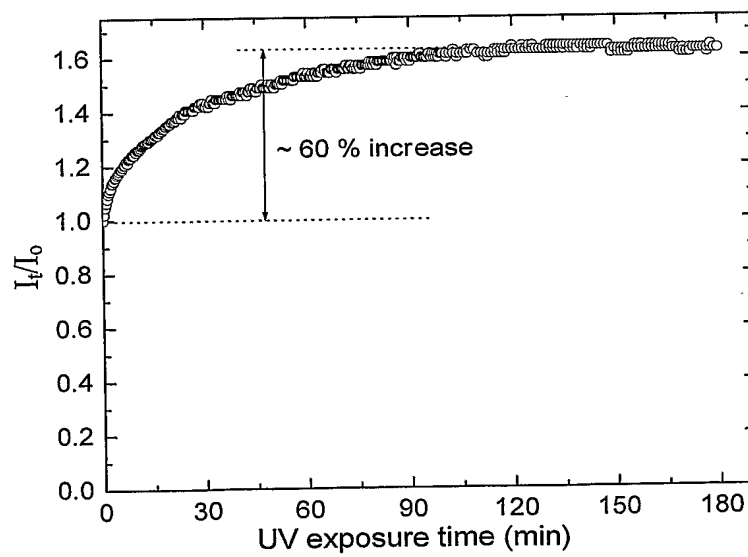


FIG. 7



7/32

FIG. 8A

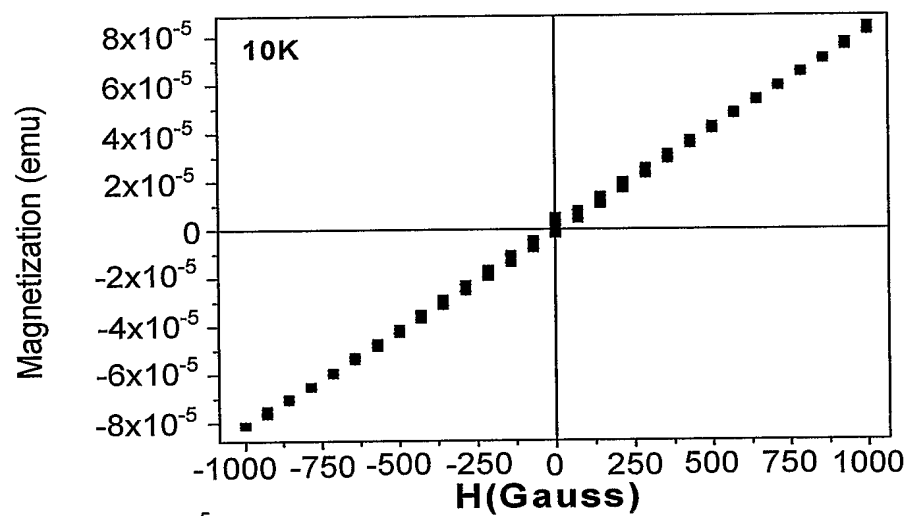
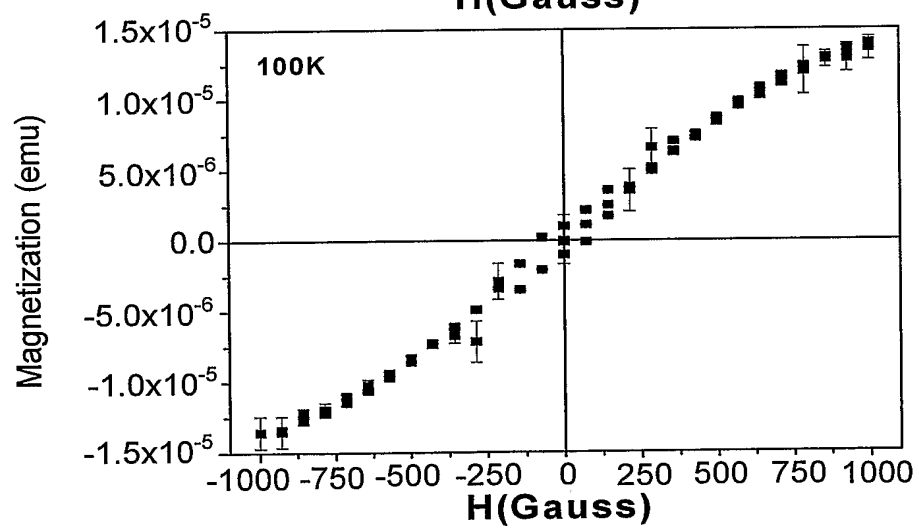
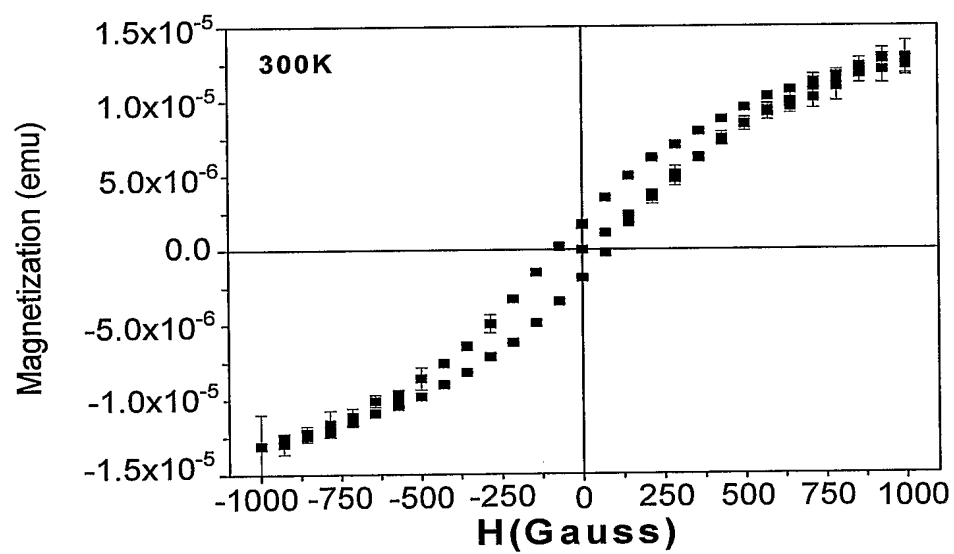


FIG. 8B



8/32

FIG. 8C



9/32

FIG. 9A

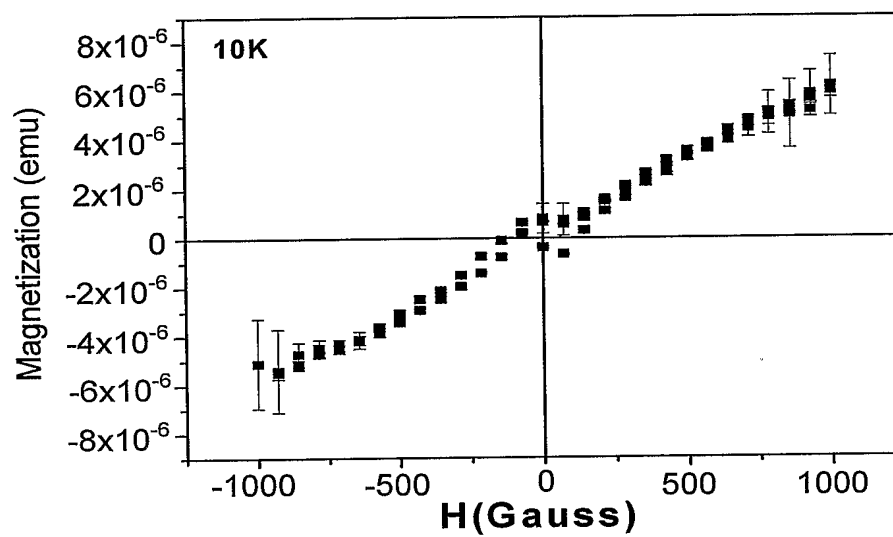
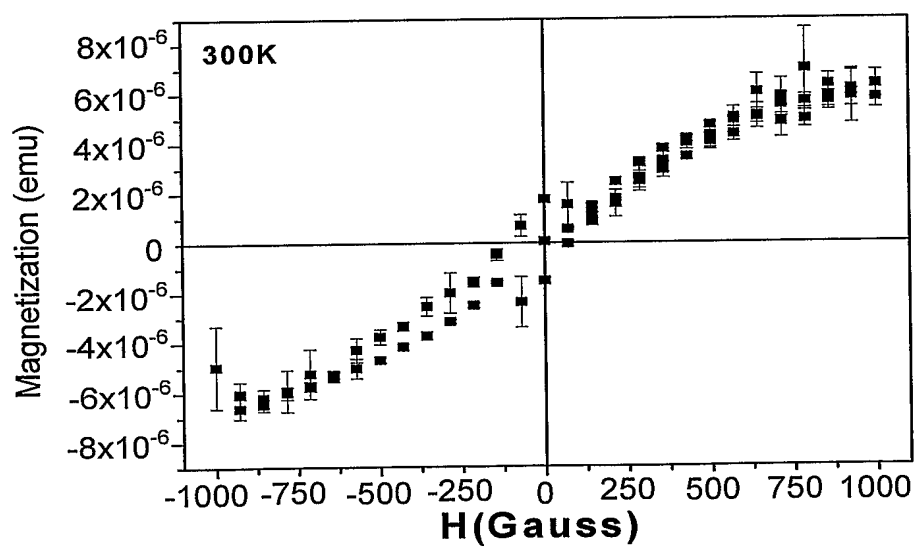


FIG. 9B



10/32

FIG. 10A

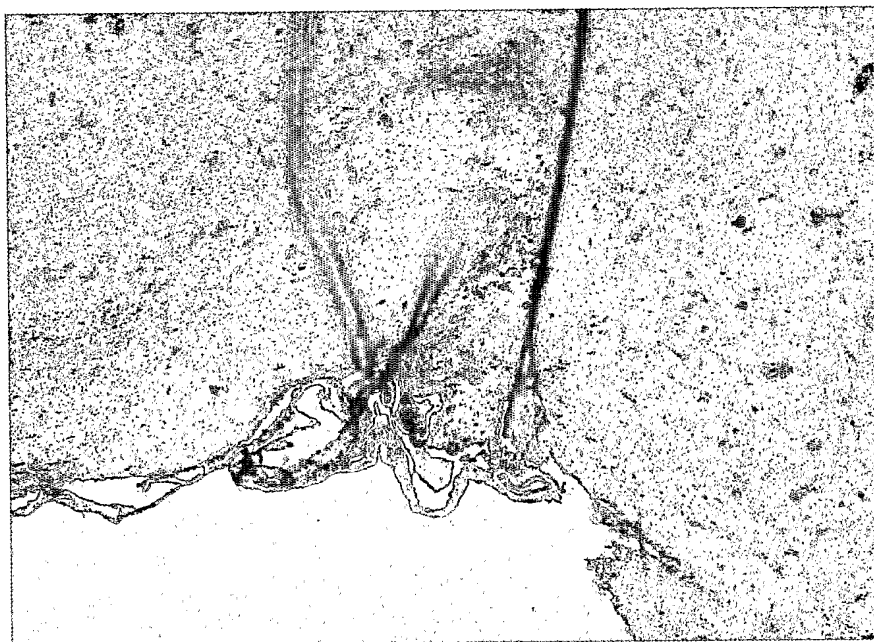


FIG. 10B



11/32

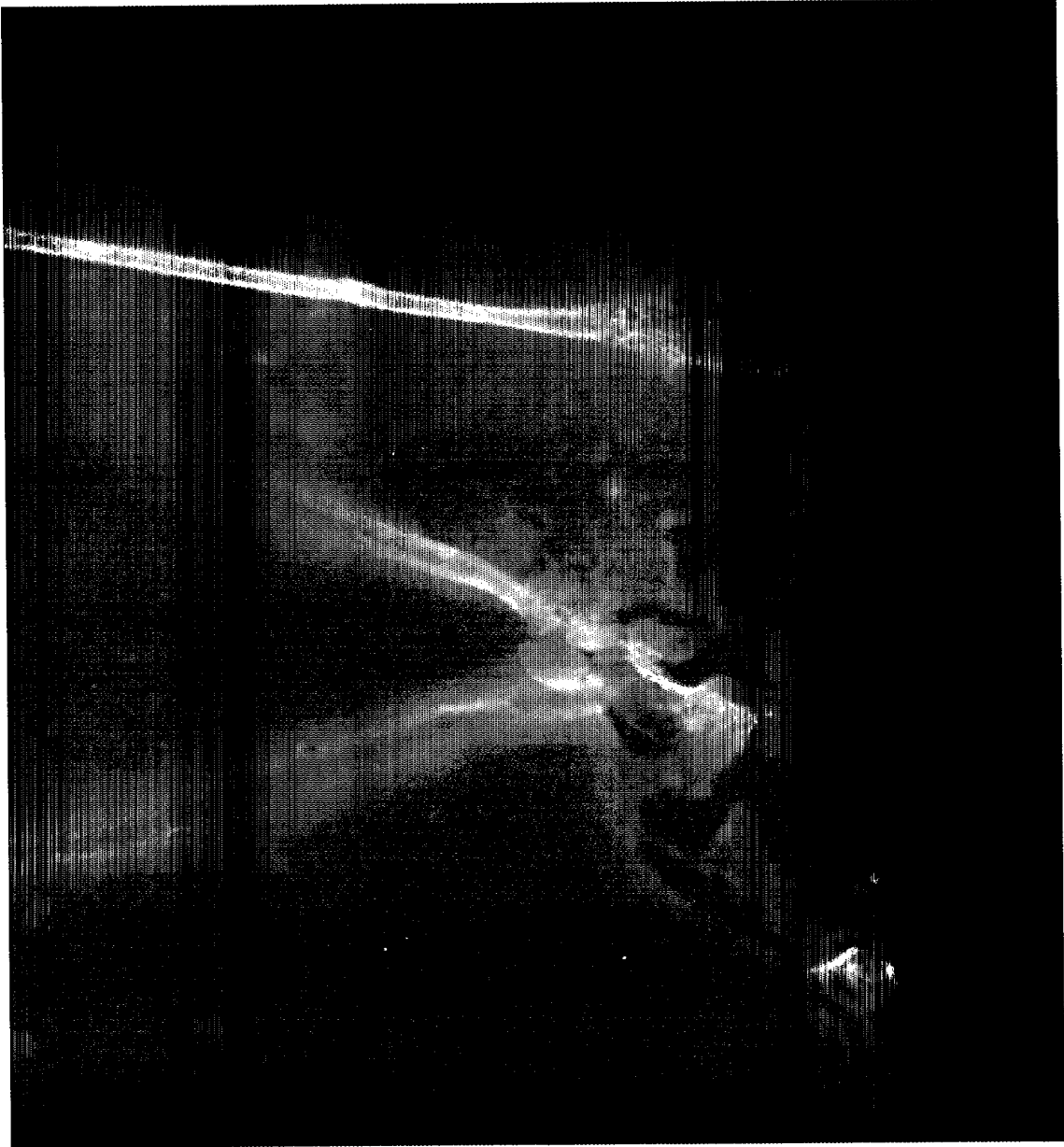


FIG. 11

12/32

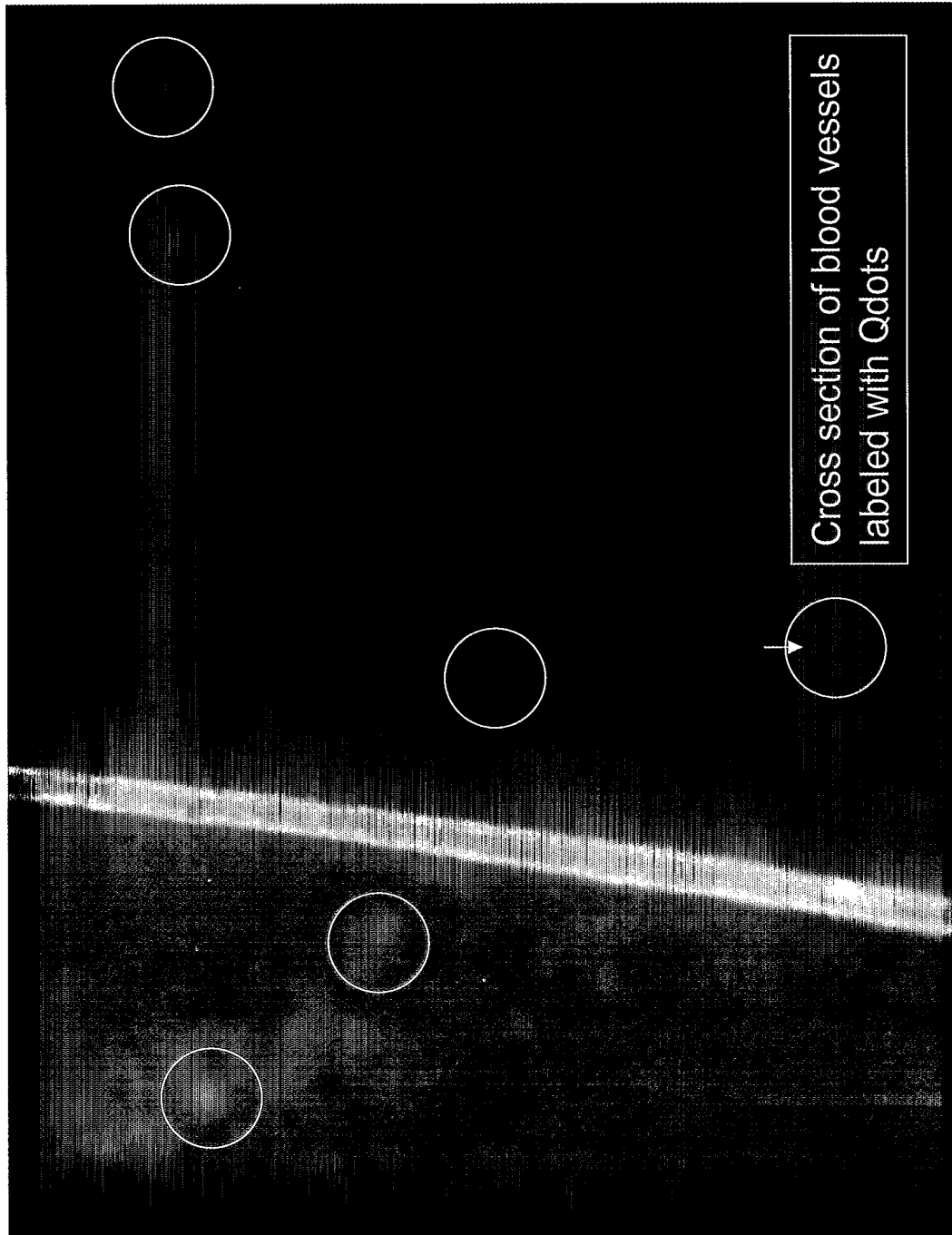


FIG. 12

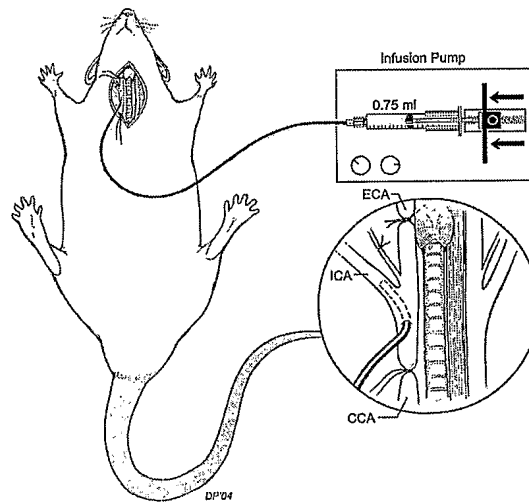


FIG. 13

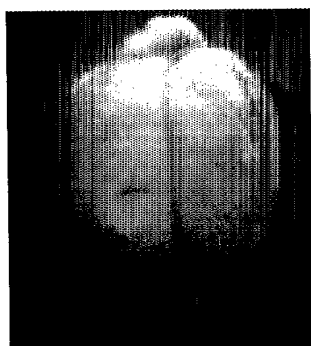


FIG. 14A

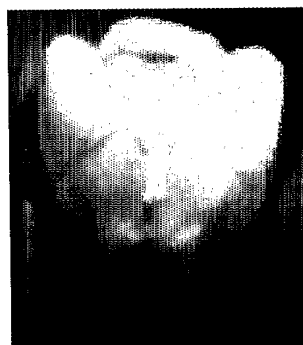


FIG. 14B

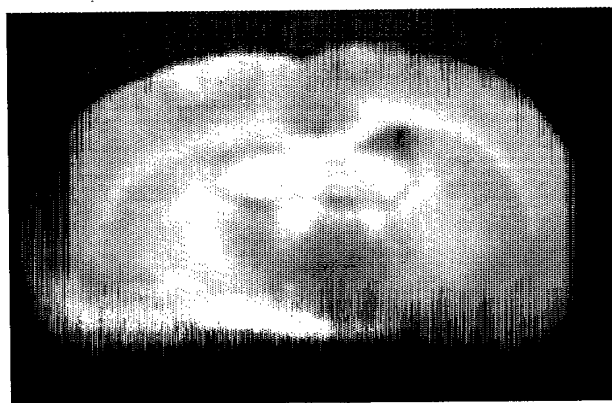


FIG. 14C

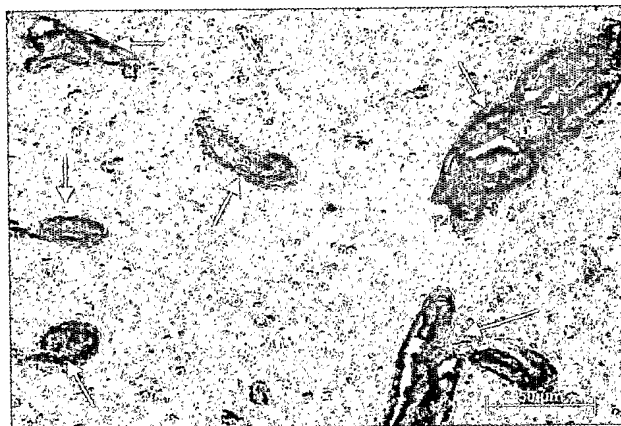


FIG. 15A

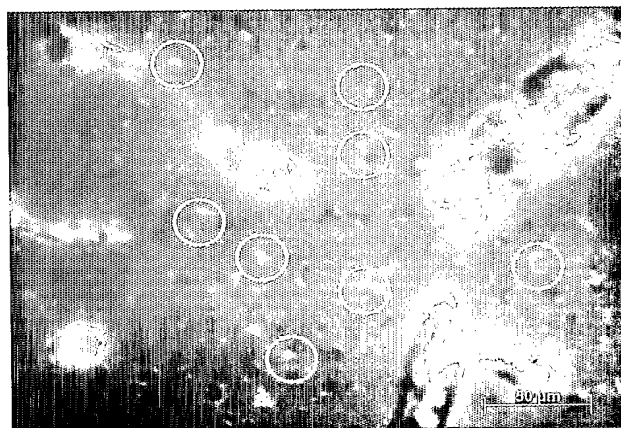


FIG. 15B

16/32

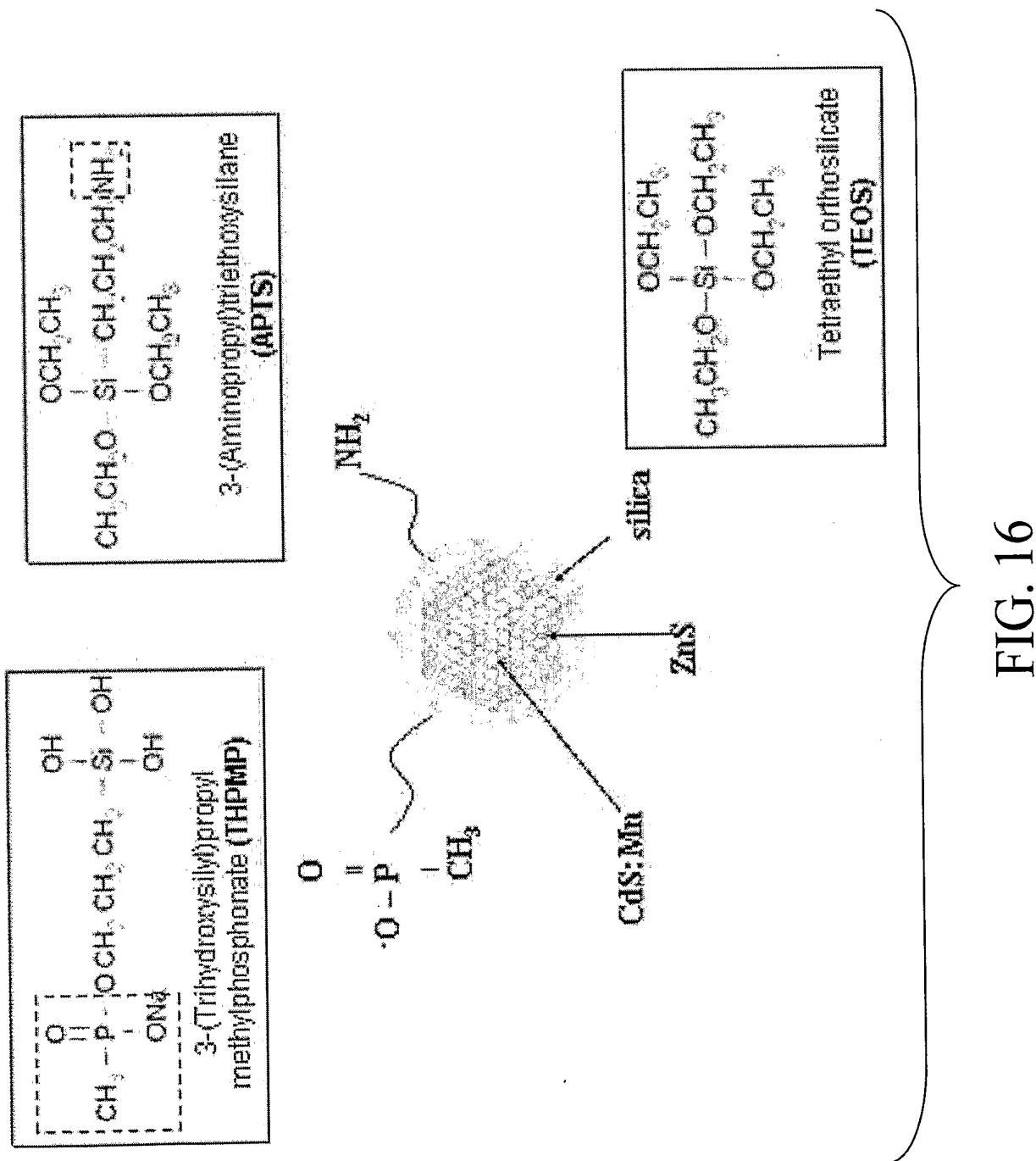


FIG. 16

17/32

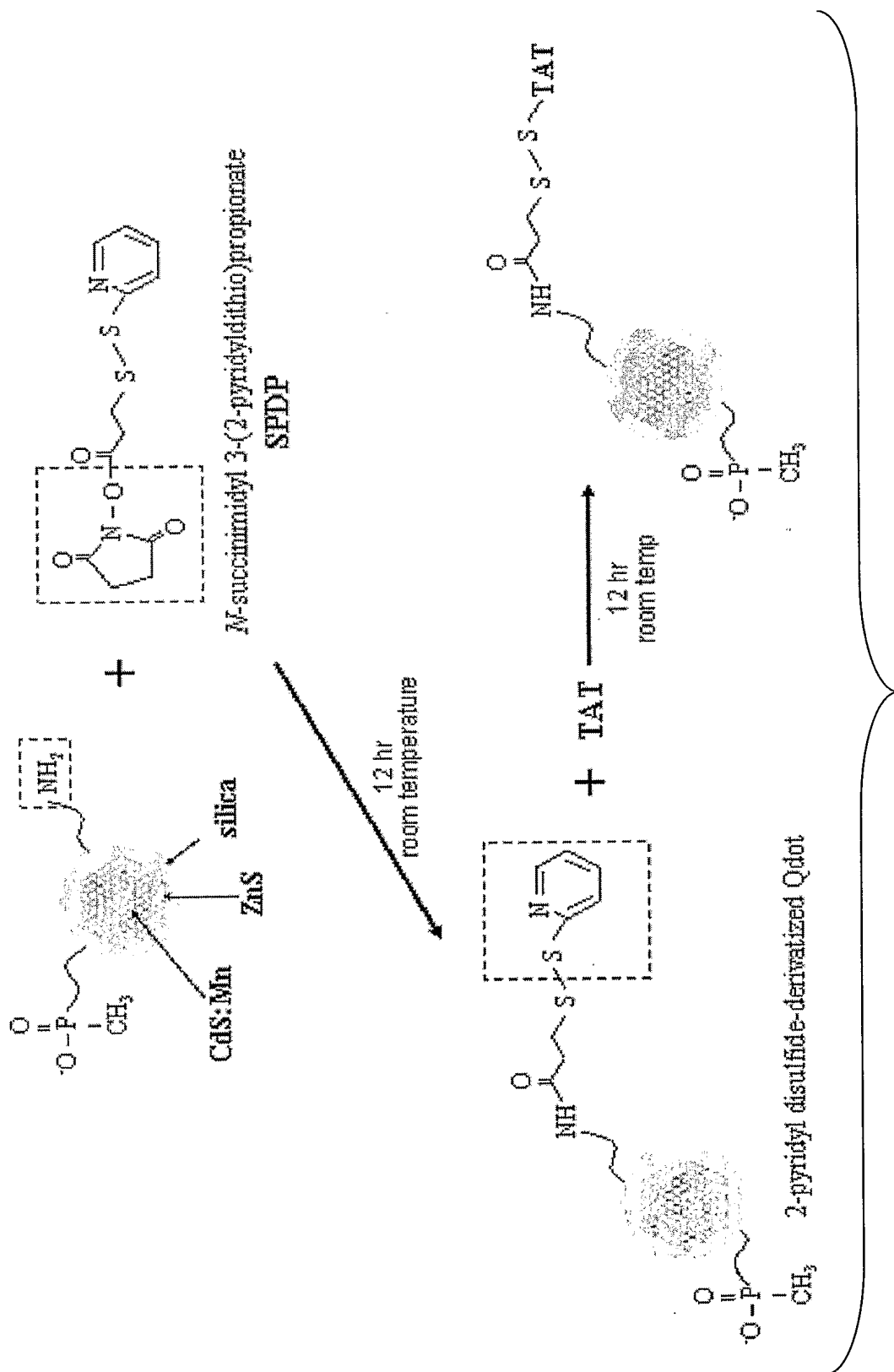


FIG. 17

18/32

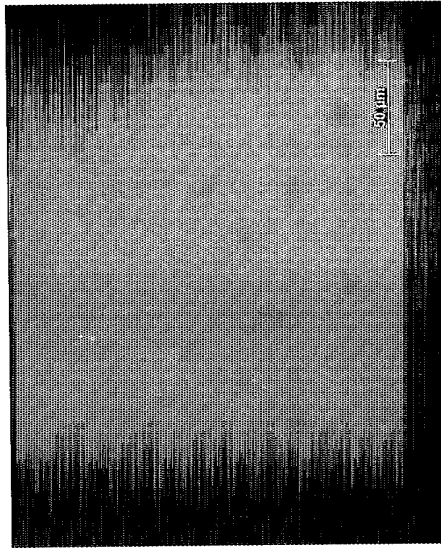
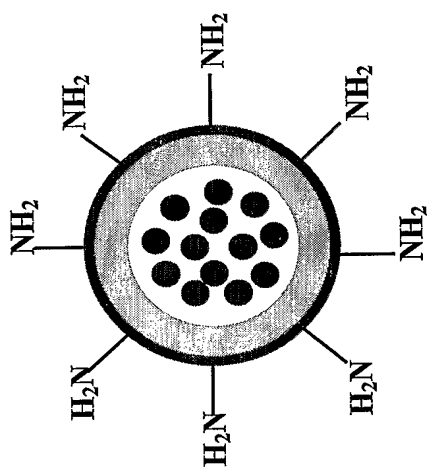


FIG. 18B



FIG. 18A

19/32



■ Fluorescent dye (Rubpy) doped silica core

■ Paramagnetic (gadolinium (III) ion bound) inner silica shell for MRI

■ Primary amine (-NH₂) functionalized outer silica shell for bioconjugation

FIG. 19

20/32

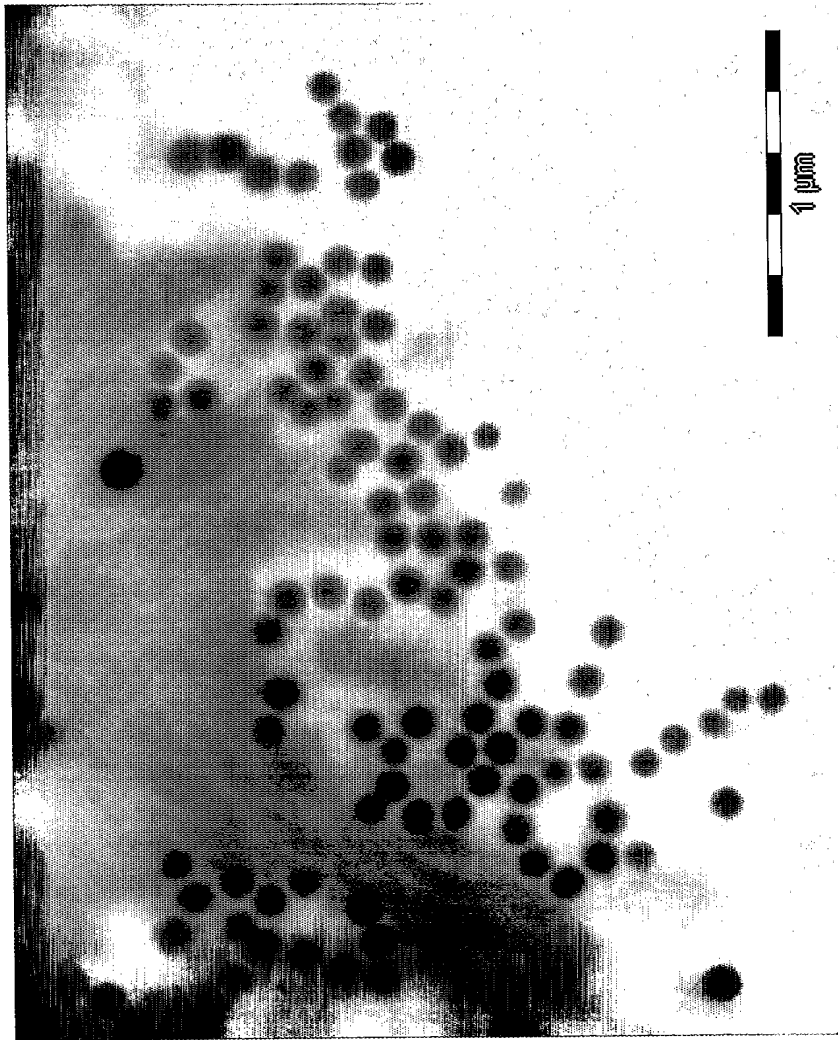


FIG. 20

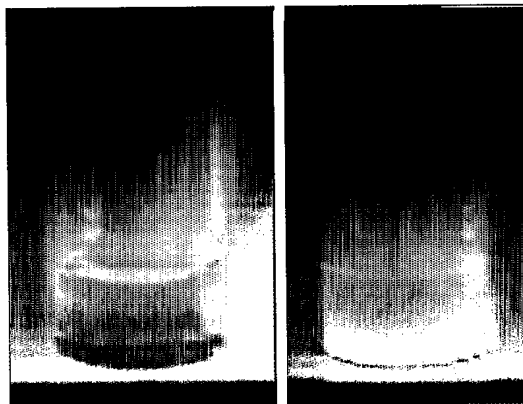


FIG. 21A

FIG. 21B

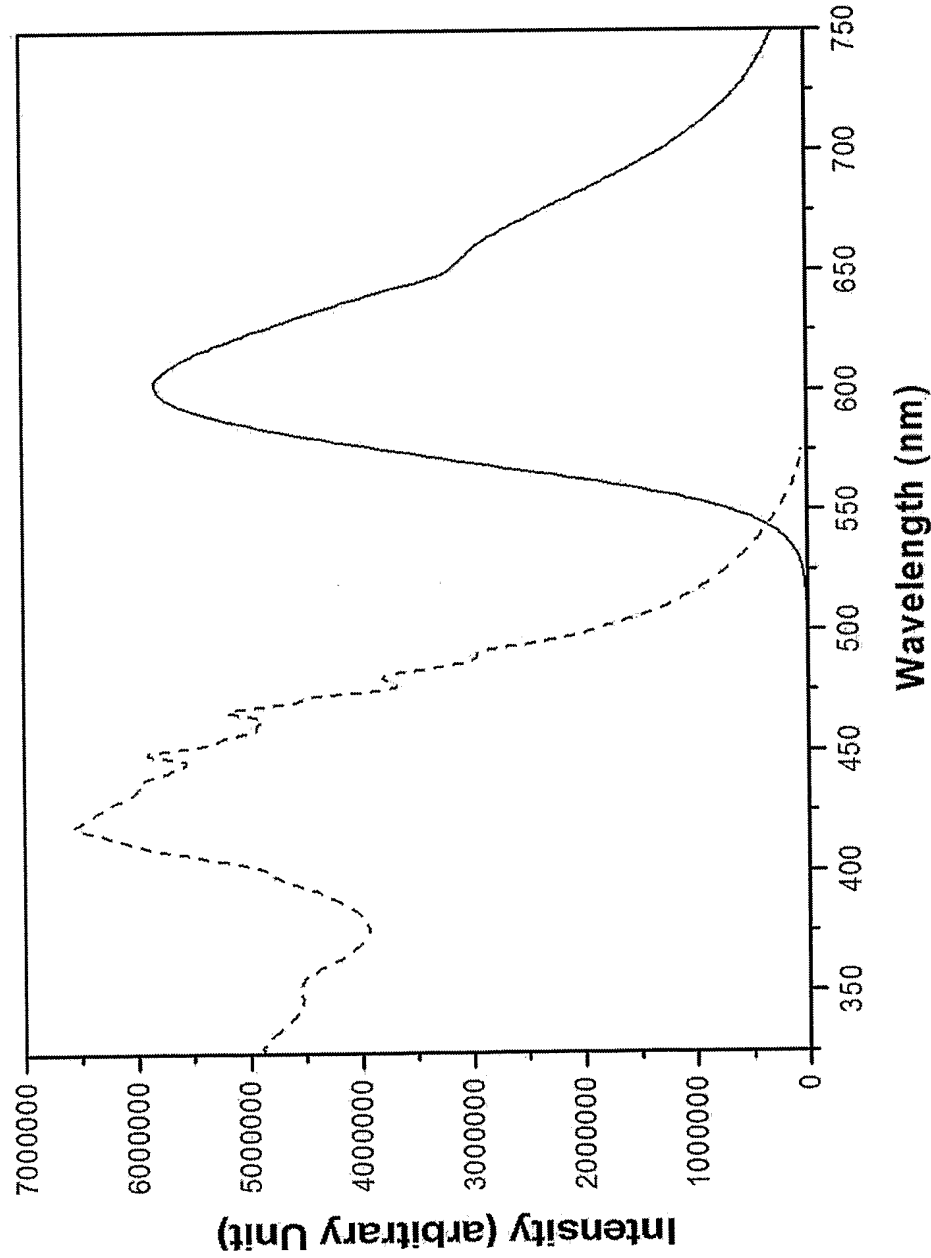


FIG. 21C

23/32

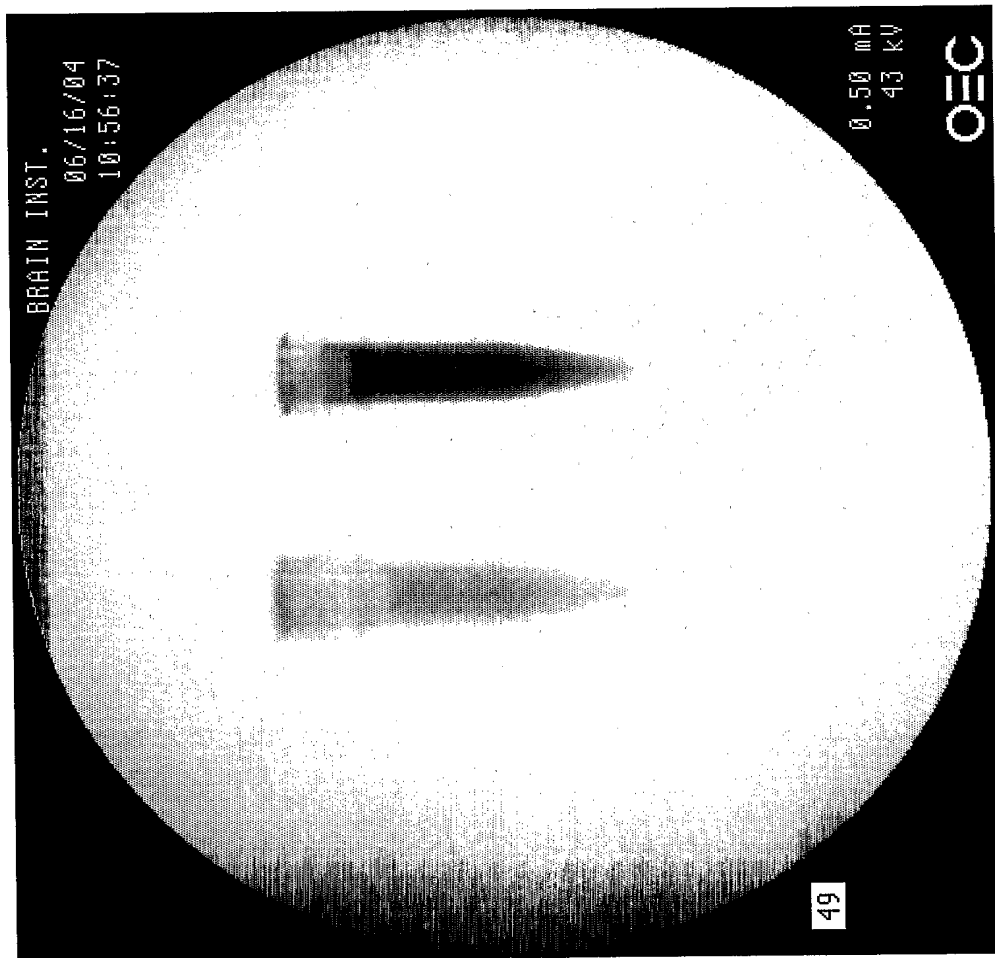


FIG. 22

24/32

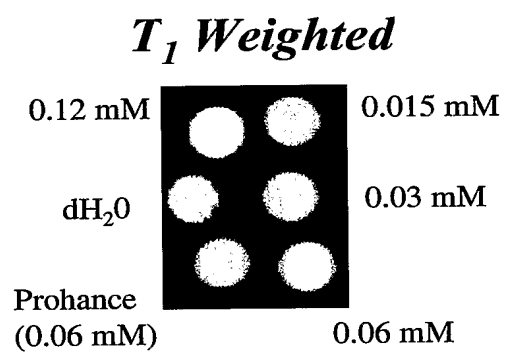


FIG. 23A

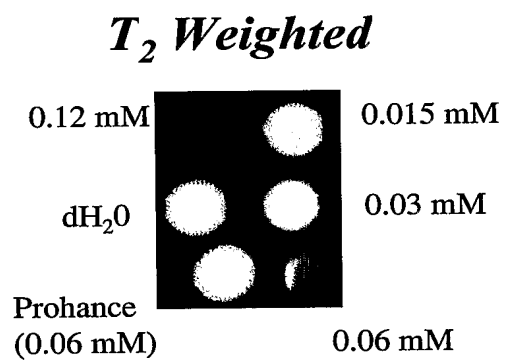


FIG. 23C

25/32

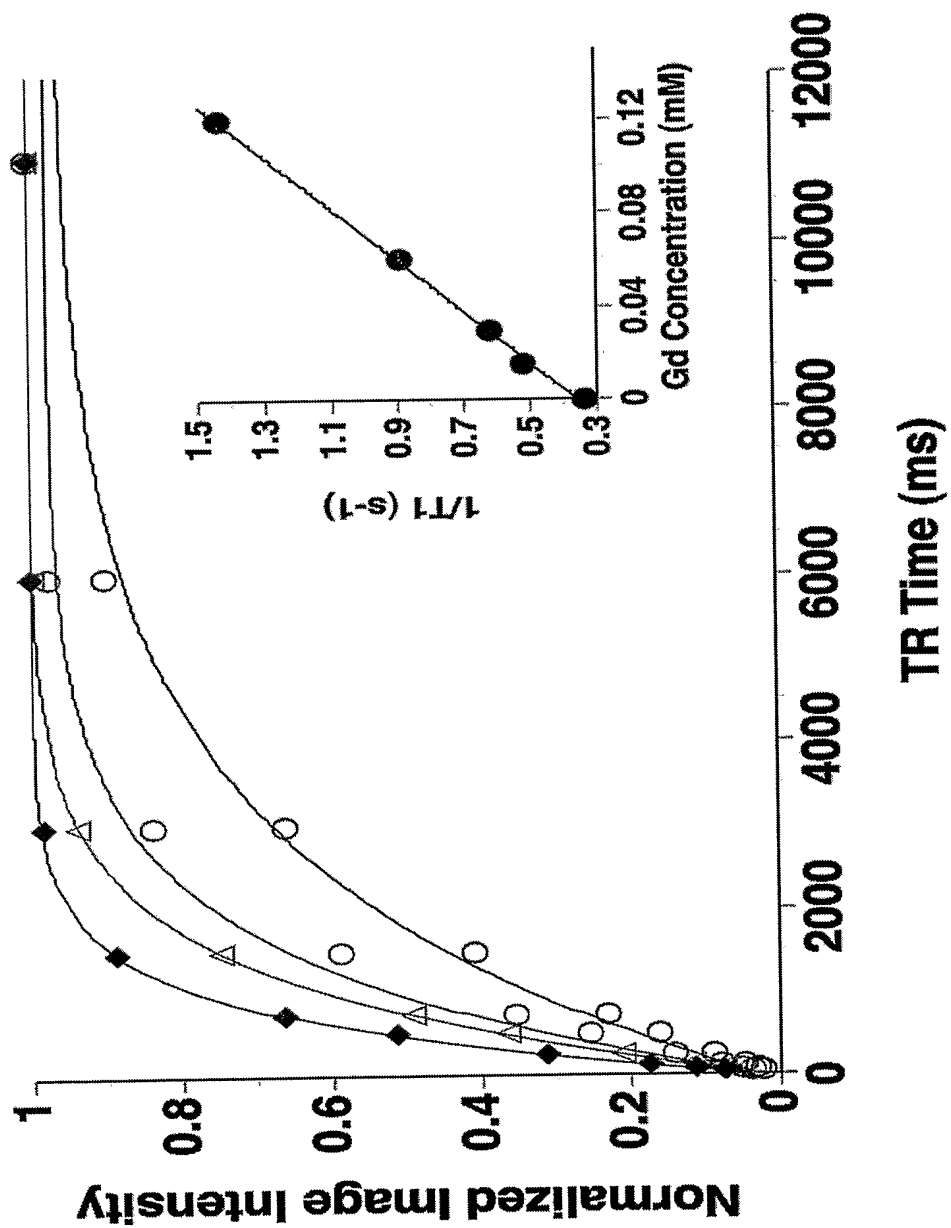


FIG. 23B

26/32

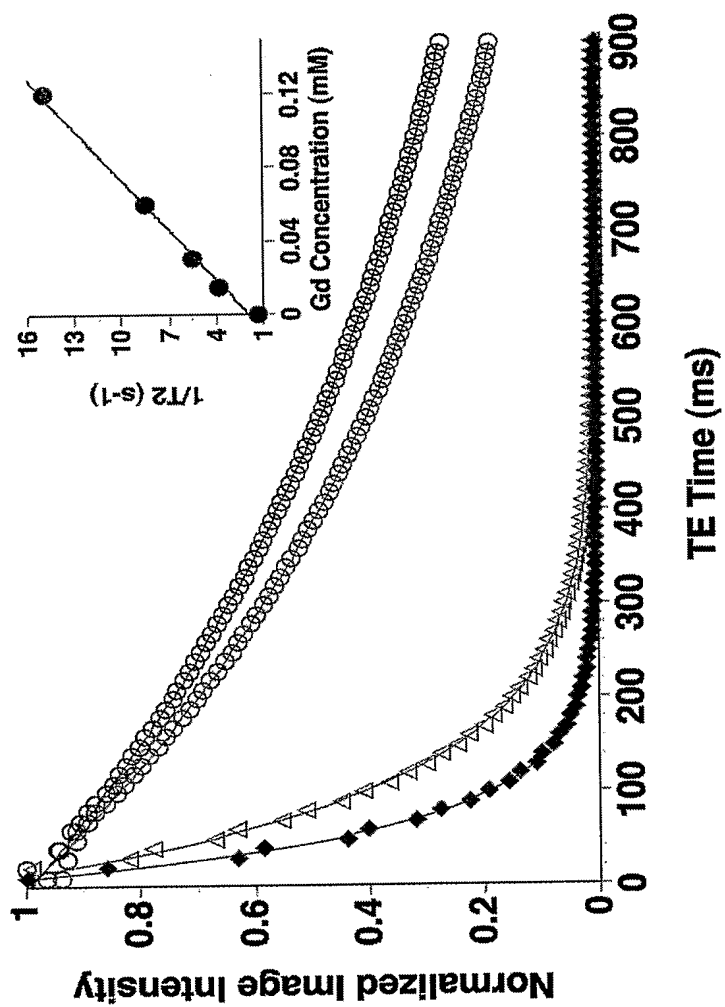


FIG. 23D

27/32

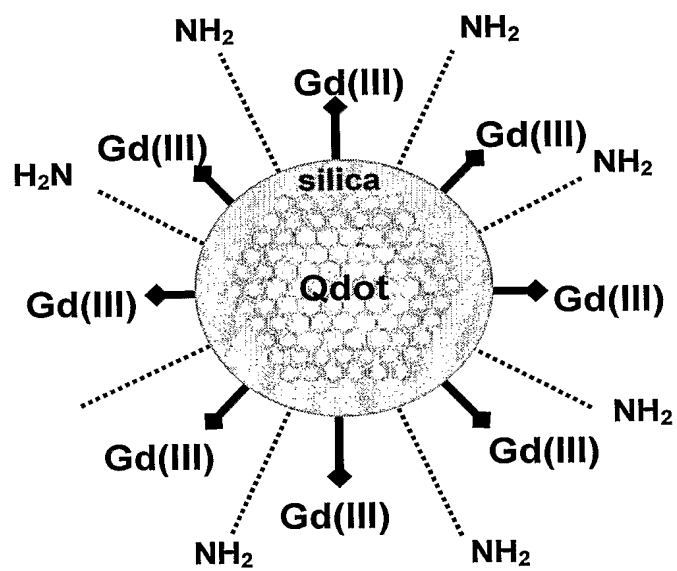


FIG. 24

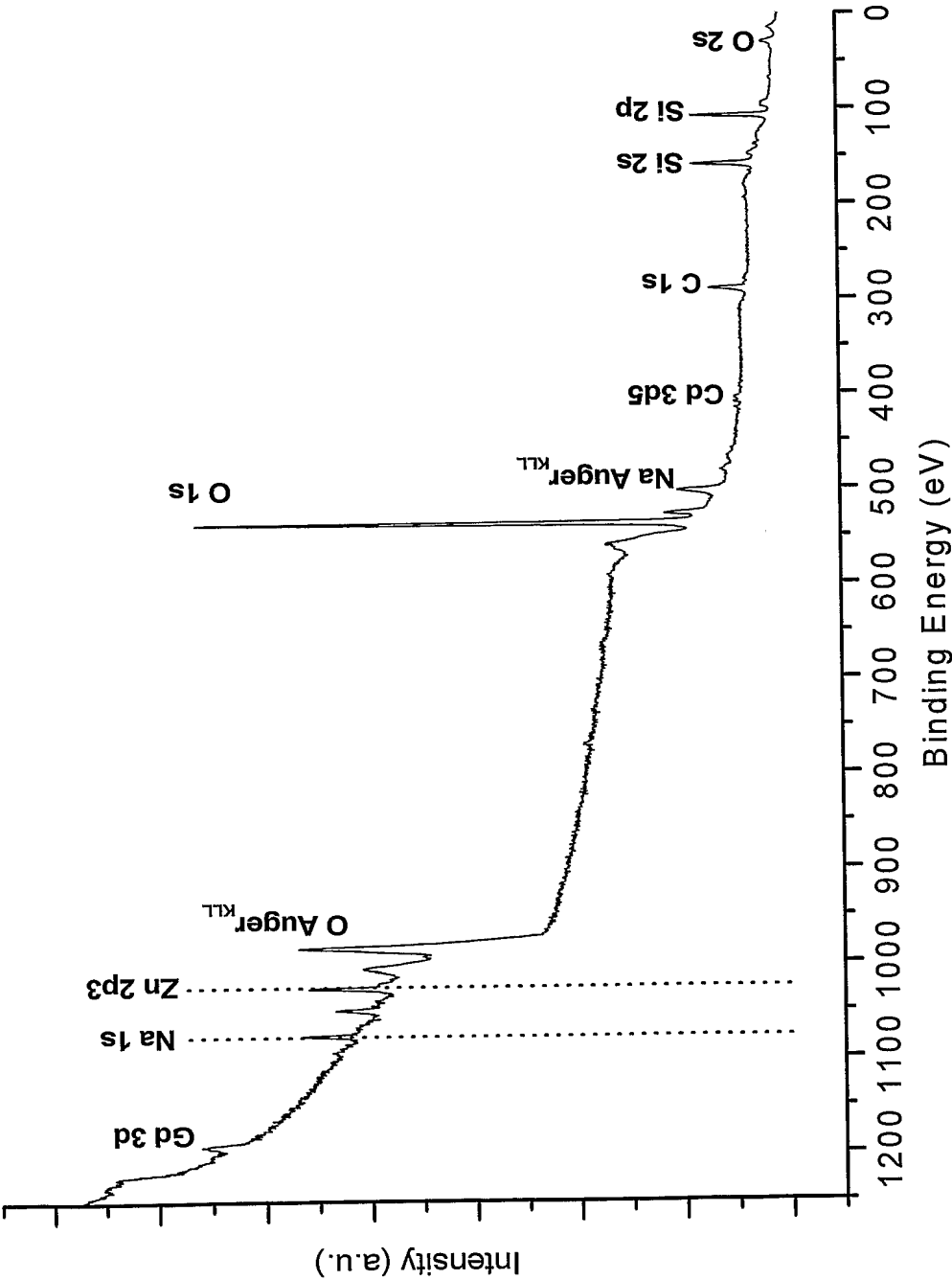


FIG. 25

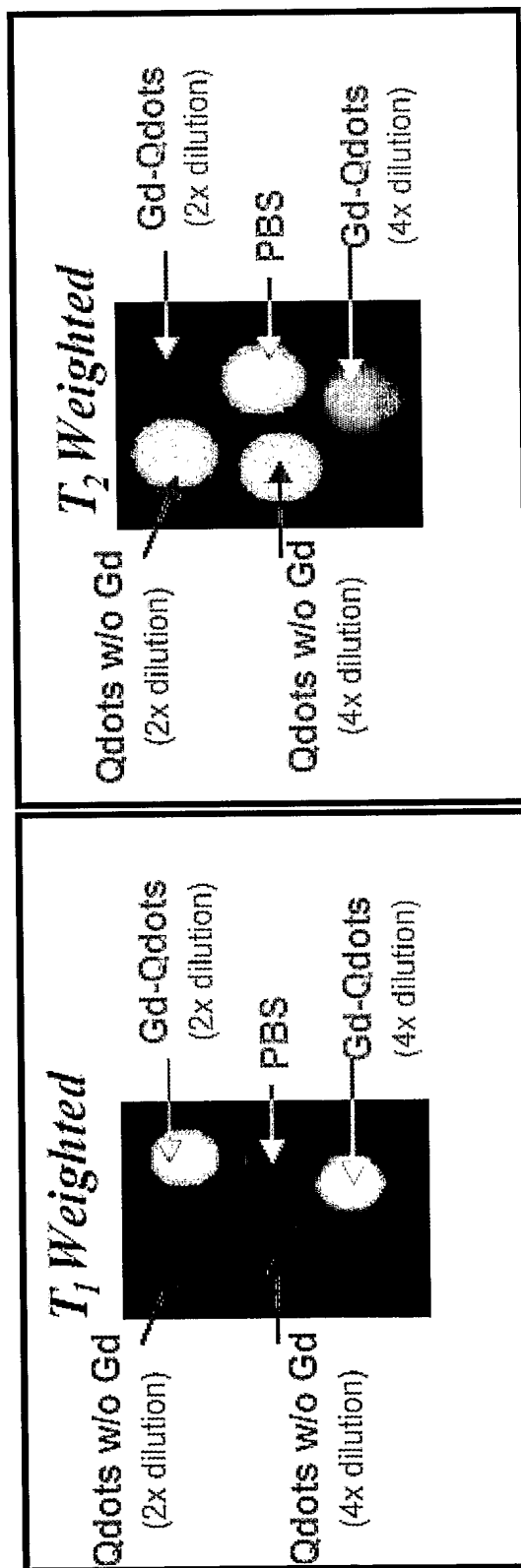


FIG. 26B

FIG. 26A

30/32

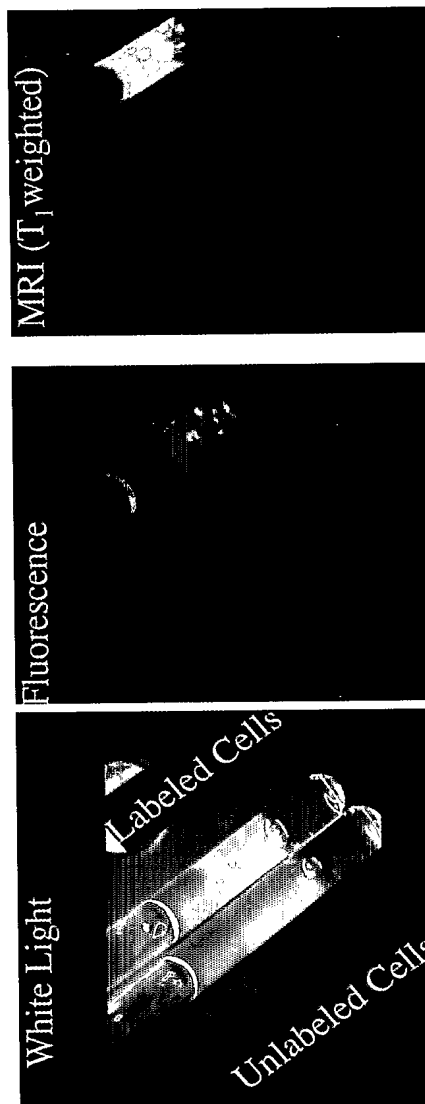


FIG. 27C

FIG. 27B

FIG. 27A

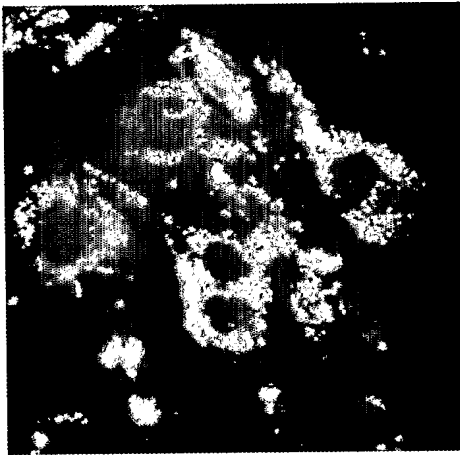


FIG. 28B

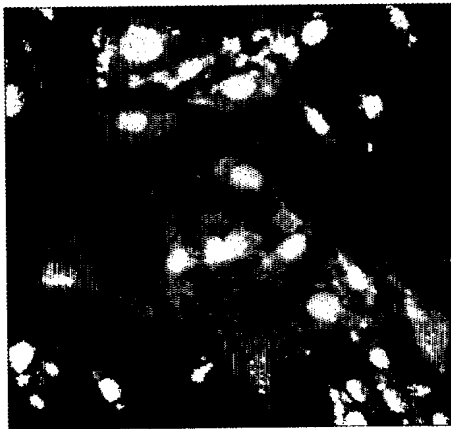


FIG. 28A

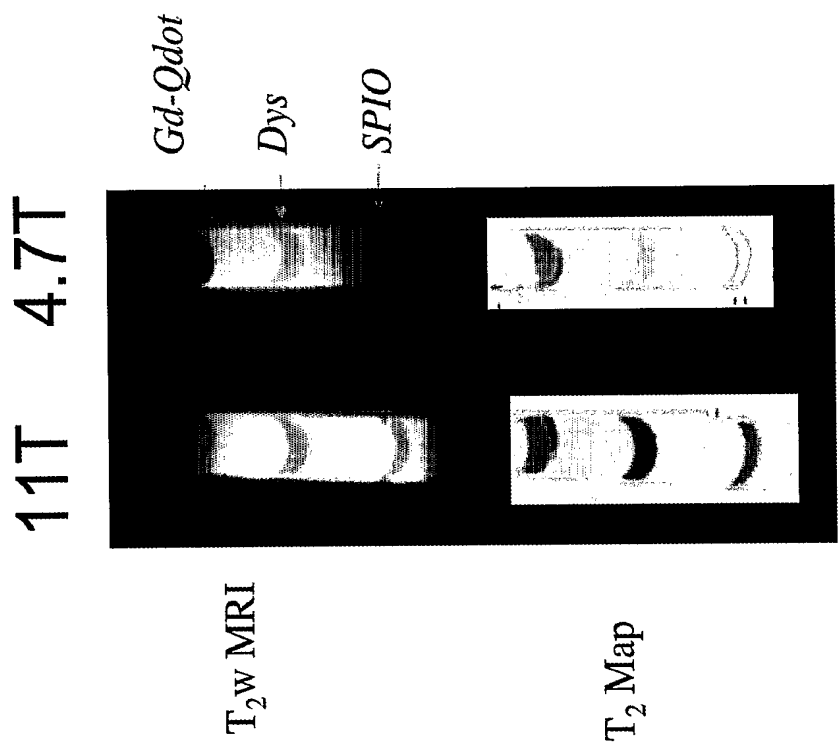


FIG. 29